



2,3,7,8-TCDD Patterns in Lower Passaic River Sediments



Presented by

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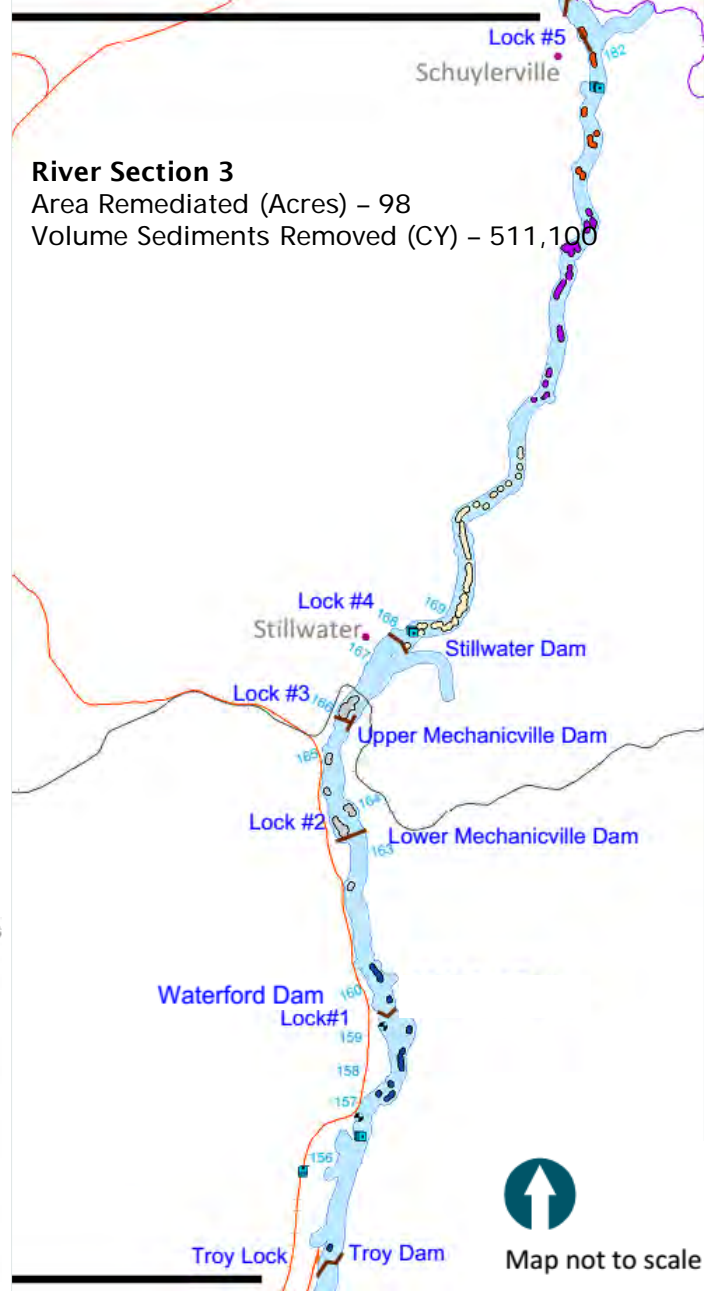
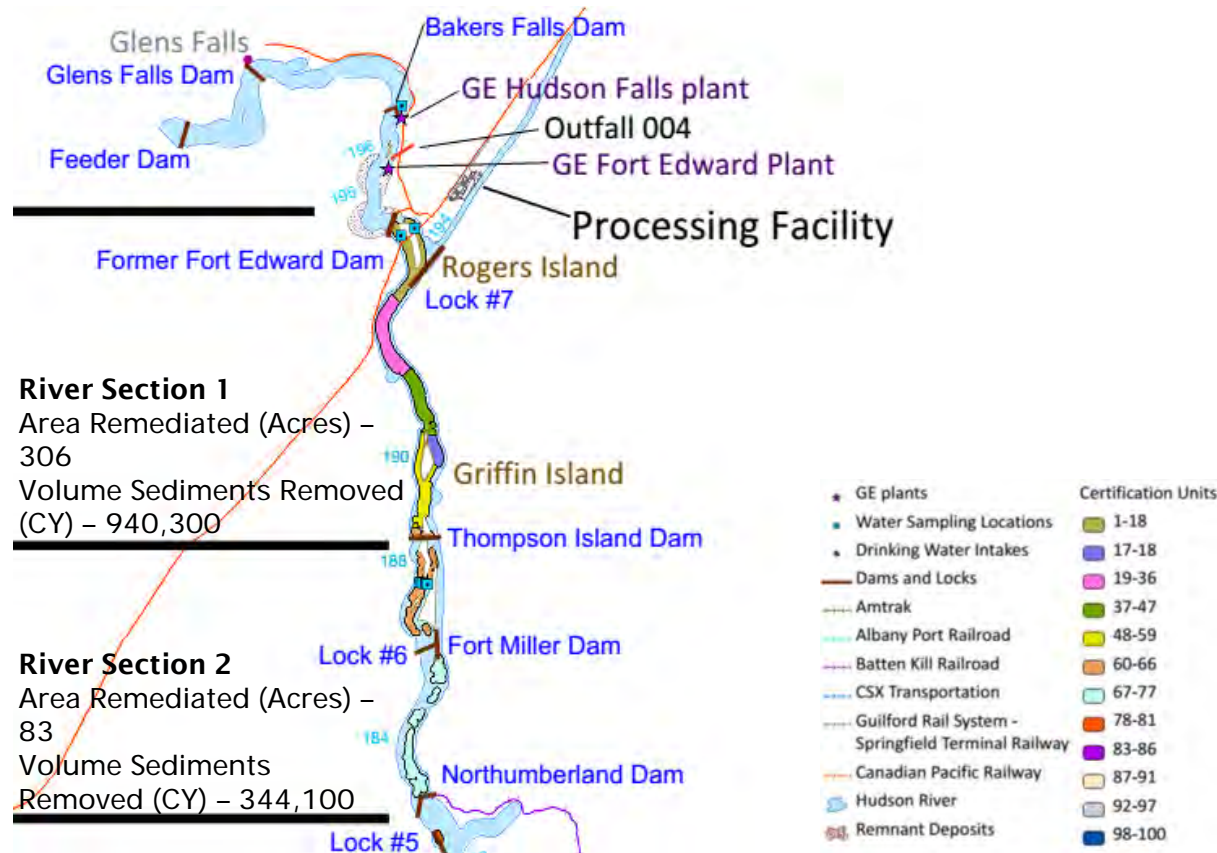
Organized Patterns in Sediments are the Norm



Photo credit: Jaime Kopchinski

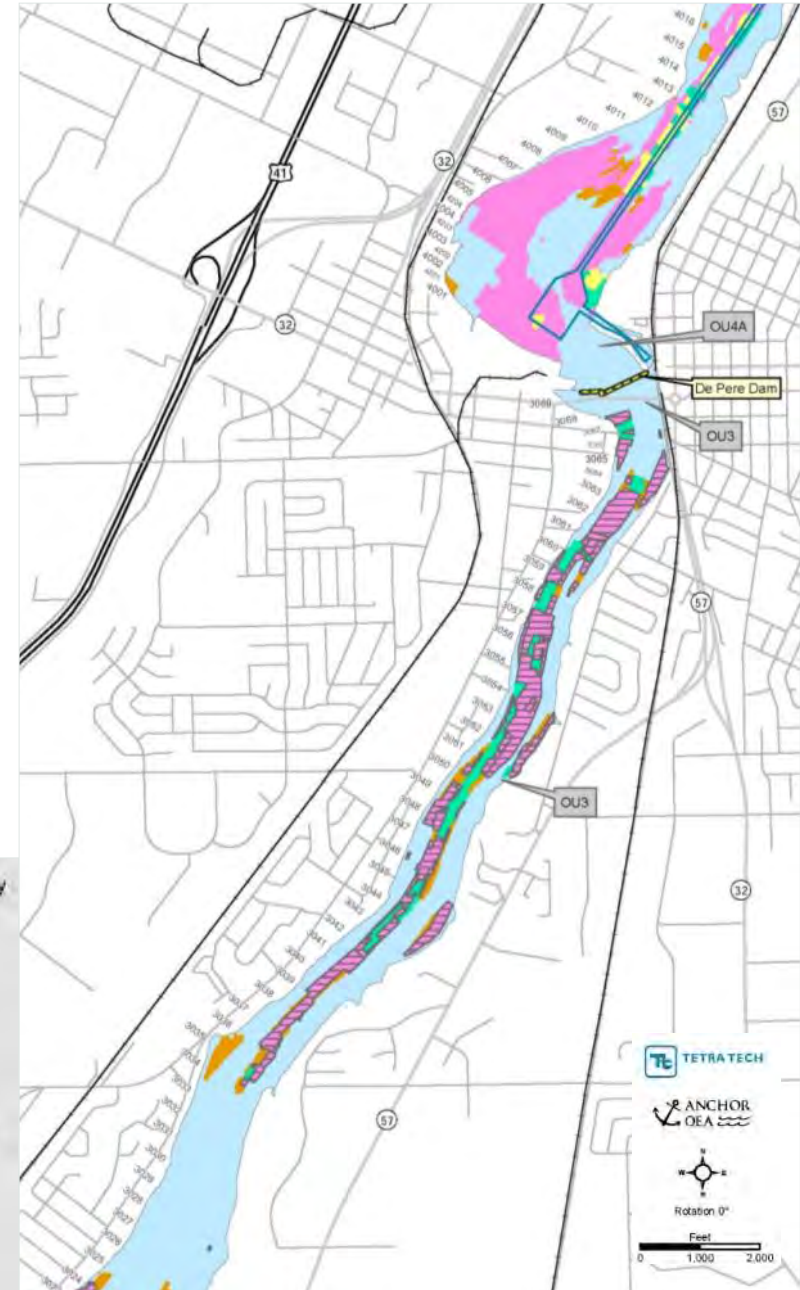
- Reflect input locations and erosion/deposition processes
- Often used to craft remedial strategies
 - e.g., Hudson River, Fox River

Hudson River Dredge Areas



Fox River Dredge Areas

- OUs 2 to 5 Remedial Action Areas



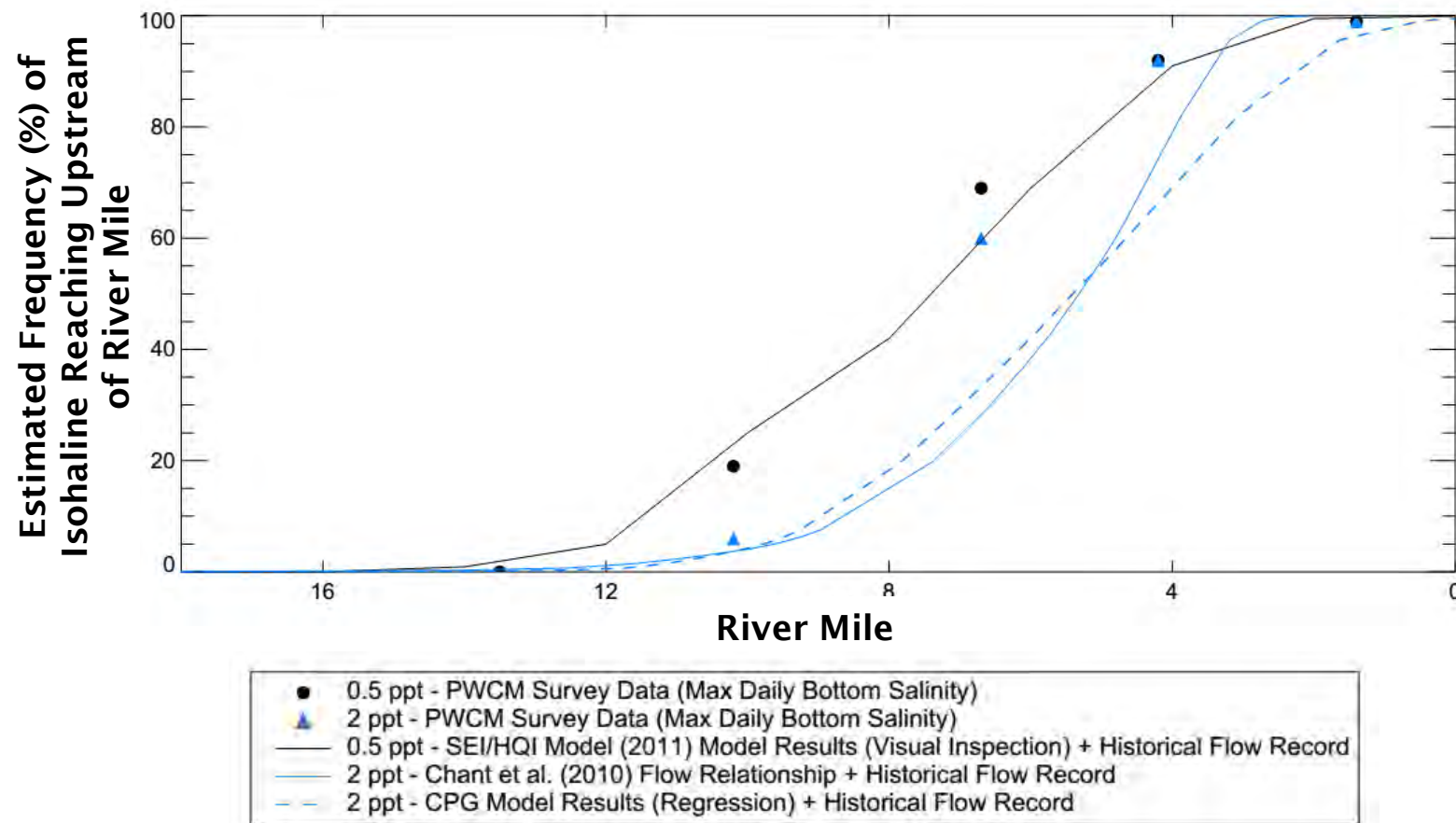
TCDD Concentration Patterns



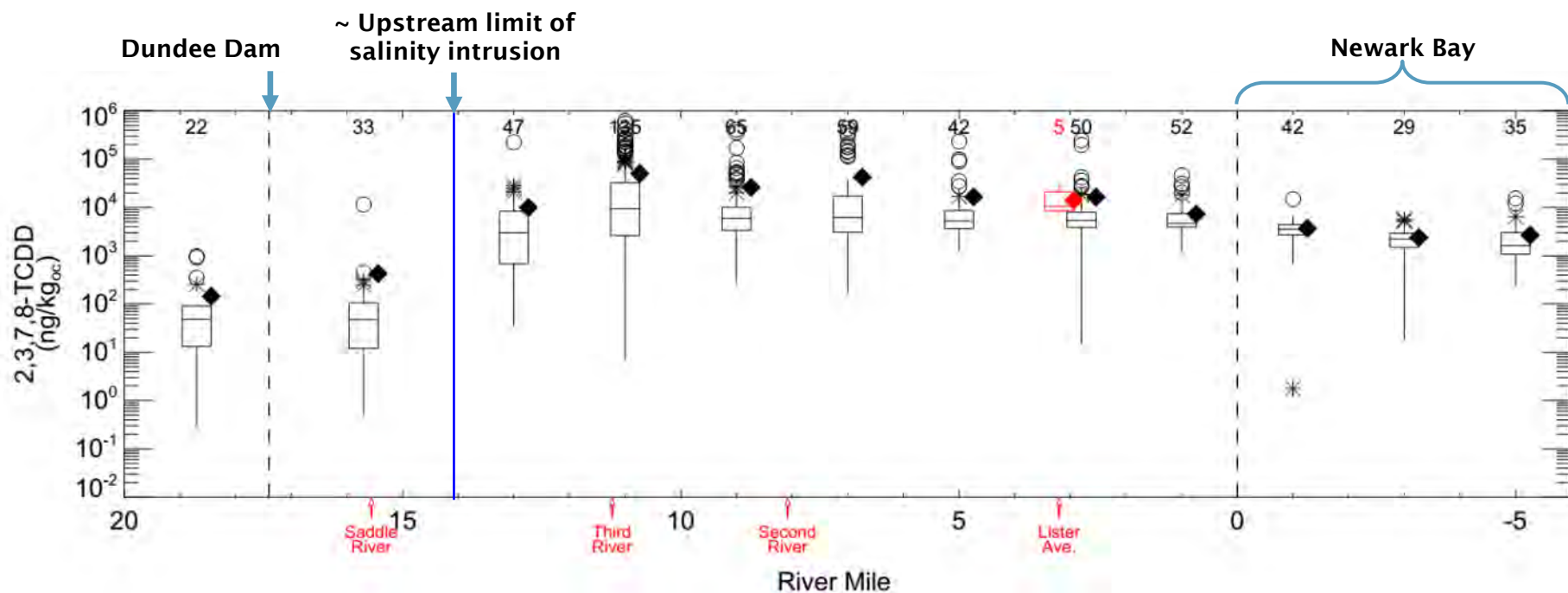
Photo credit: Steven Reynolds

- TCDD concentration patterns in the Passaic reflect
 - Upstream tidal transport to the limit of salinity intrusion
 - Depositional history
 - Transitions between shoal and channel
 - Recent erosion/deposition patterns

Salinity Intrusion Occurs as Far Upstream as River Mile 14



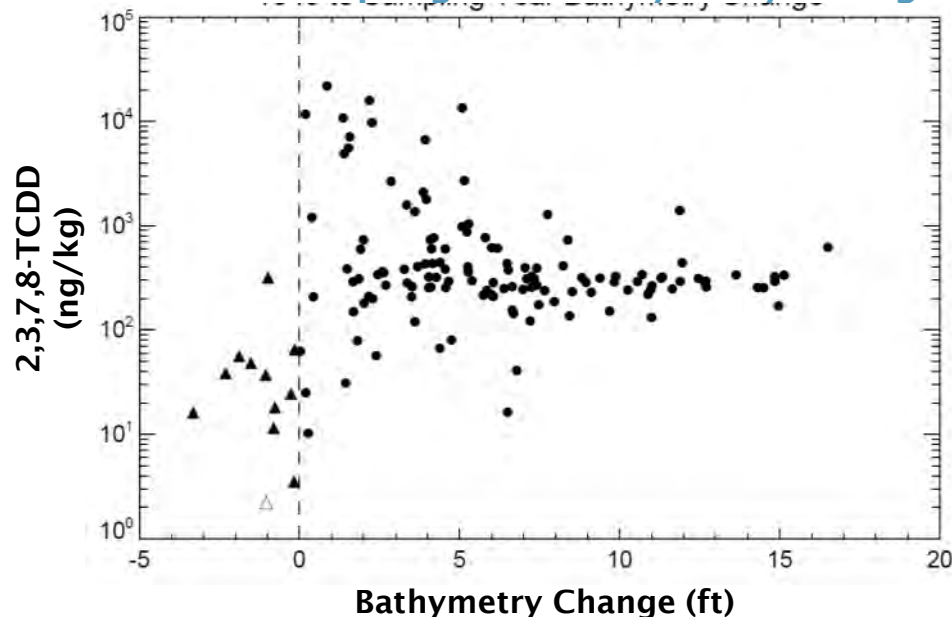
2,3,7,8-TCDD Surface Sediment Concentrations Low Upstream of RM 14



Reflects source located within the salt wedge and upstream transport to the limit of salinity intrusion

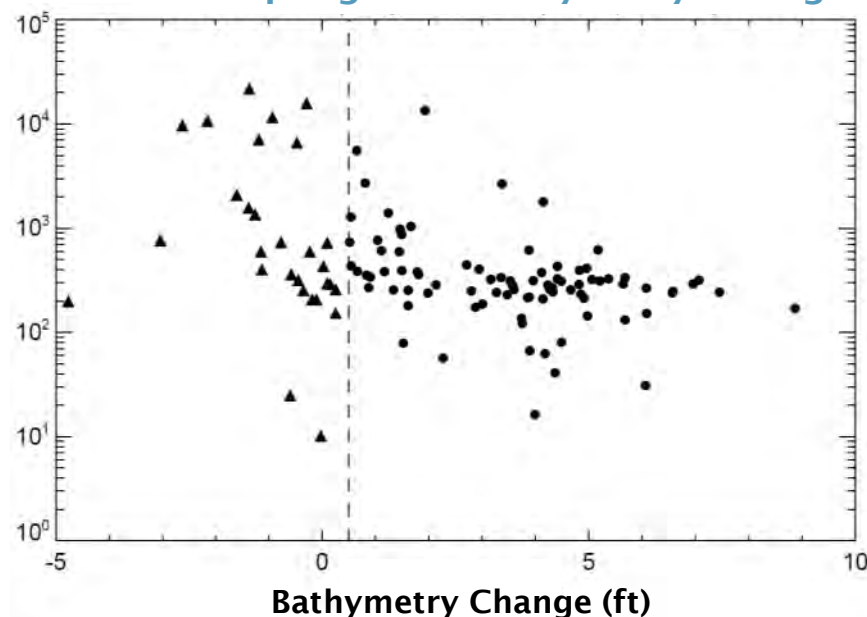
2,3,7,8-TCDD Concentrations Relate to Bathymetry Changes

1949 to Sampling Year Bathymetry Change



- ▲ No Sediment Accumulation
- Sediment Accumulation

1966 to Sampling Year Bathymetry Change*

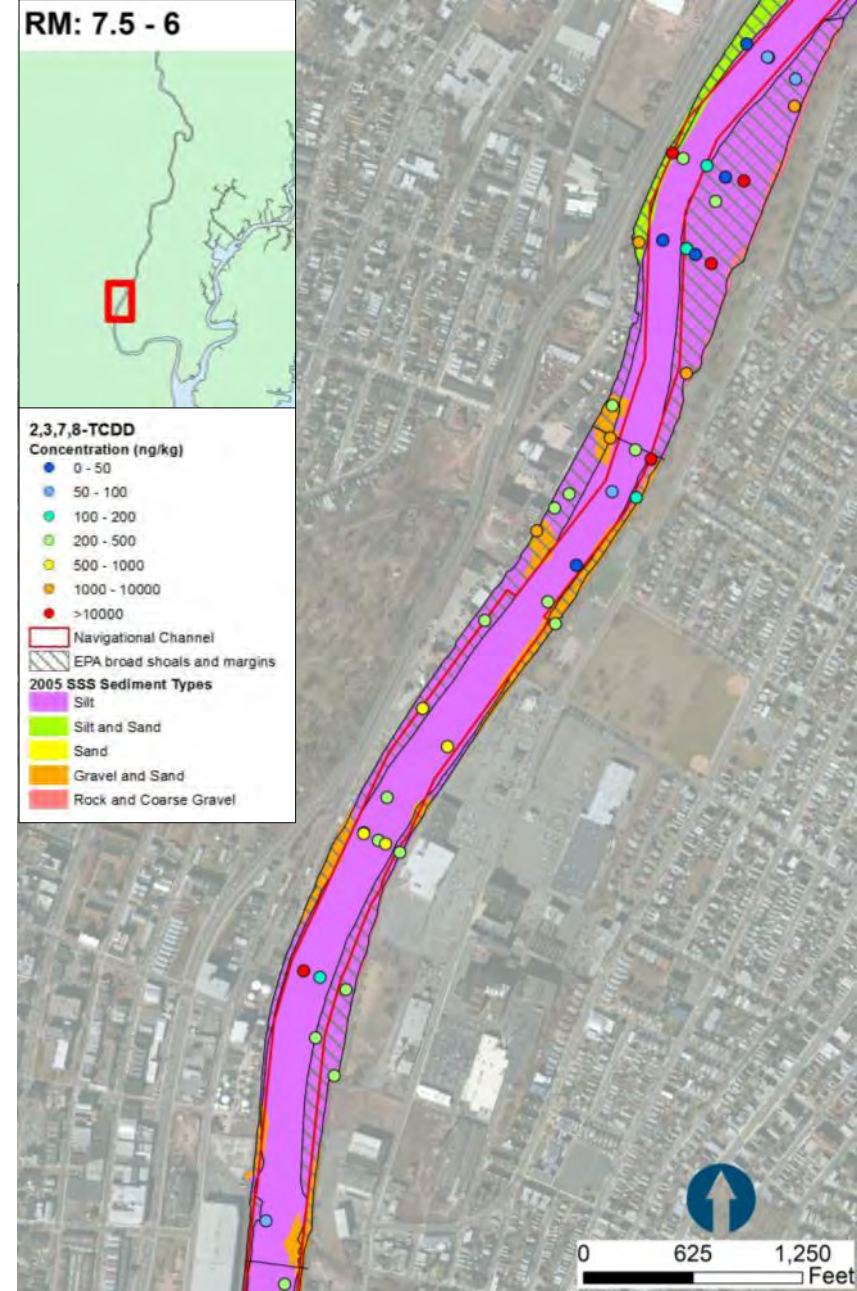


- ▲ Erosion or < 6" of Deposition
- > 6" of Deposition

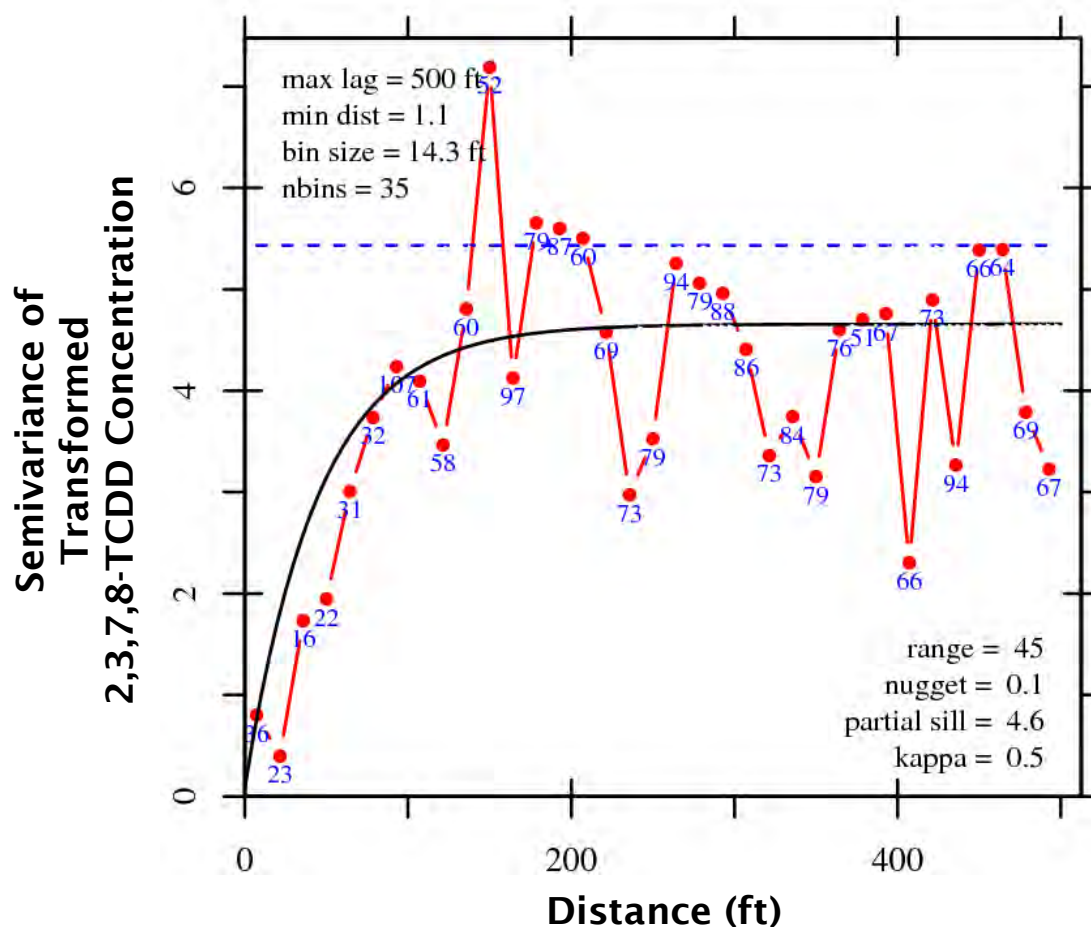
*Only includes locations that experienced net deposition since 1949.

Local Patterns Exist in Surface Sediment Concentrations

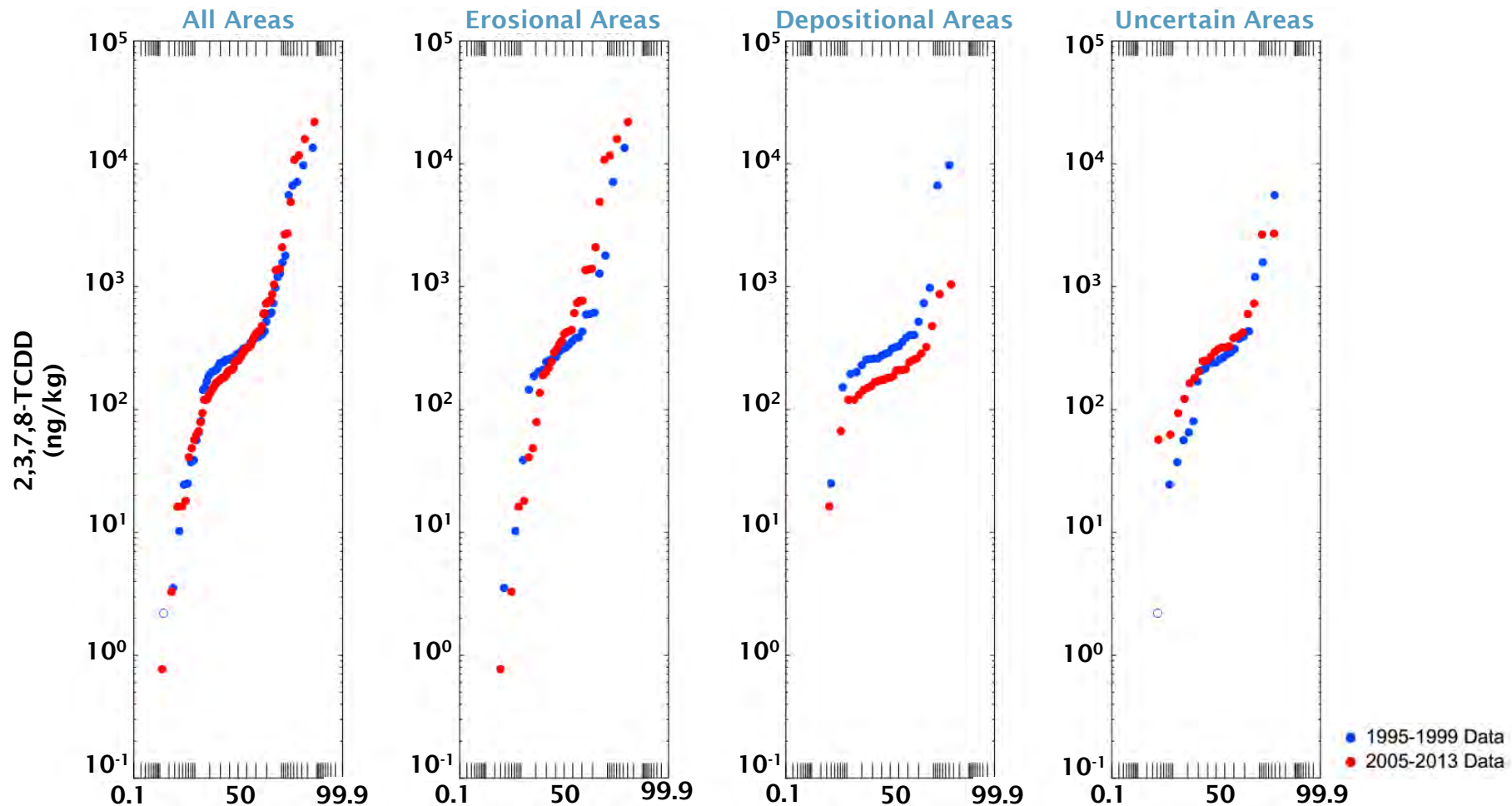
- Along-river correlation within deposits
- Cross-river gradients reflecting geomorphology



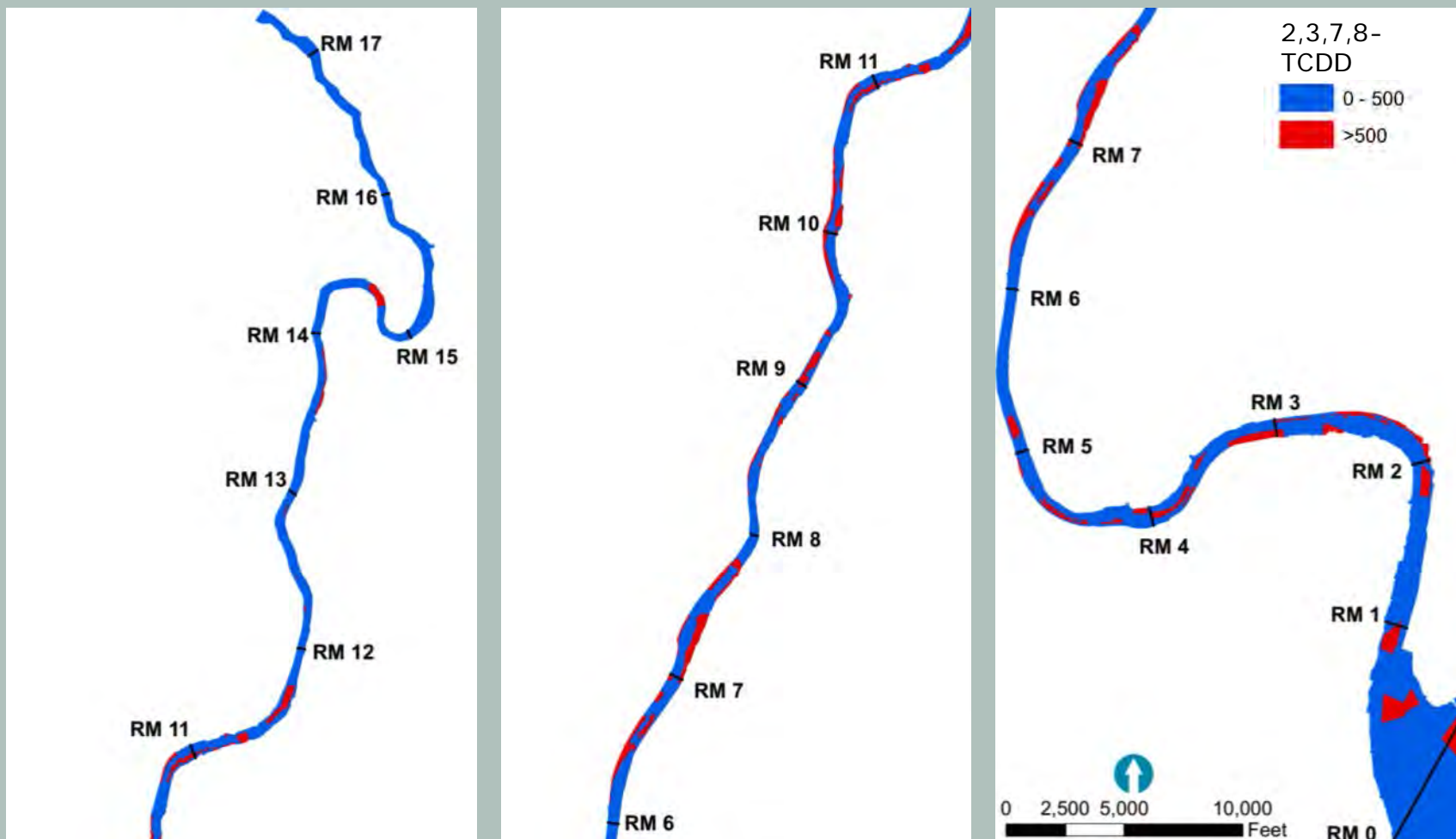
Variogram Shows Strong Along-River Concentration Correlation on the Scale of 100 ft



Surface 2,3,7,8-TCDD Changes Relate to Recent Erosion/Deposition



Higher 2,3,7,8-TCDD Concentrations in Discrete Pockets



Conclusions

- Areas of high and low sediment contamination are identifiable and related to
 - Extent of upstream transport
 - Long-term deposition patterns
 - Geomorphology
 - Recent erosion/deposition
- Concentrations are higher at locations that
 - Accumulated sediment since 1949
 - Sediments deposited in the 1960s are within the top 6 inches today
- Concentrations are declining at locations that are still depositional

Questions/Discussion



Photo credit: eutrofication&hypoxia

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